WHAT IS CLAIMED IS:

1. A device for obtaining energy from a vehicle tire while said tire is rotating upon a load-bearing surface, the device comprising:

an energy converter mounted on the tire, coupled to the load-induced deflections of at least one tire inner wall, and converting said deflections into an output energy form.

2. The device according to claim 1 wherein said output energy form is electrical.

3. The device according to claim 1 wherein said energy converter is adapted to be mounted between the inner walls of the tire.

4. The device according to claim 1 wherein said energy converter is adapted to be mounted onto an inner surface of the tire.

5. The device according to claim 4 wherein said inner surface is the inner tread surface.

6. The device according to claim 4 further comprising a base plate attached to said energy converter.

7. The device according to claim 6 further comprising an adhesive patch, adhered to said inner surface and securing said base plate, for attaching the energy converter to the inner surface of the tire.

8. The device according to claim 6 wherein said base plate is flexible and adapted to be mounted within the tire.

9. The device according to claim 4 further comprising at least one fastener for attaching the energy converter to said inner surface of the tire.

10. The device according to claim 1 which further couples to the inner wall motion using at least one push rod attached to the at least one inner wall.

11. The device according to claim 1 which further couples to the inner wall motion using at least one cable attached to the at least one inner wall.

12. The device according to claim 1 which further responds to the centrifugal force of the rotating tire.

13. The device according to claim 1 wherein said energy converter comprises a magnet and coil that are moved relative to each other by said coupled deflections.

14. The device according to claim 1 wherein said energy converter comprises a piezo-electric material that is deformed by said coupled deflections.

15. A device, adapted to be mounted on a vehicle tire, for obtaining energy from the load-induced tire deflections of at least one tire inner wall while rotating upon a load-bearing surface, the device comprising:

a substrate; and

an energy converter, mounted on the substrate, coupled to said deflections and converting said deflections into an output energy form.

16. The device according to claim 15 wherein said substrate is mounted between the inner walls of the tire.

17. The device according to claim 15 wherein said substrate is adapted to be mounted on an inner surface of the tire.

18. The device according to claim 17 wherein said inner surface is the inner tread surface.

19. The device according to claim 15 wherein said substrate is embedded in a wall of the tire.

20. The device according to claim 15 further comprising a base plate attached to the substrate for attaching the device to an inner surface of the tire.

21. The device according to claim 20 further comprising an adhesive patch, adhered to said inner surface and securing said base plate, for attaching the energy converter to said inner surface of the tire.

22. The device according to claim 20 wherein said base plate is flexible and adapted to be mounted within the tire.

23. The device according to claim 17 further comprising a fastener for attaching the substrate to said inner surface of the tire.

24. The device according to claim 15 wherein the output energy form is electrical.

25. The device according to claim 24 wherein said electrical output energy is pulsed.

26. The device according to claim 25 wherein the energy converter comprises a magnet and a coil that are moved relative to each other by the said coupled deflections.

27. The device according to claim 25 wherein the energy converter comprises a piezo-electric material that is deformed by the said coupled deflections.

28. The device according to claim 25 further comprising capture electronics for capturing said pulsed electrical energy.

29. The device according to claim 28 wherein said capture electronics maximizes the captured energy by adaptation to at least one characteristic of the pulsed electrical energy.

30. The device according to claim 29 wherein said capture electronics comprises:

at least one capacitor where the said at least one characteristic is the pulse width of the pulsed electrical energy; and

the adaptation is to select the value of the at least one capacitor based on the pulse width of the pulsed electrical energy.

31. The device according to claim 29 wherein said capture electronics comprises:

at least one capacitor where the said at least one characteristic is the voltage captured on the at least one capacitor from the pulsed electrical energy; and

the adaptation is to select the at least one capacitor value based on said voltage.

32. The device according to claim 15 which further couples to the inner wall motion using at least one push rod attached to the at least one inner wall.

33. The device according to claim 15 which further couples to the inner wall motion using at least one cable attached to the at least one inner wall.

34. The device according to claim 15 which further responds to the centrifugal force of the rotating tire.

35. In a tire adapted to be mounted on a vehicle wheel, a device for obtaining energy from the tire while said tire is rotating upon a load-bearing surface, the device comprising:

an energy converter coupled to the load induced deflections of at least one tire inner wall for converting said deflections into an output energy form.

36. The device according to claim 35 wherein said energy converter is adapted to be mounted between the inner walls of the tire.

37. The device according to claim 35 wherein the energy converter is adapted to be mounted on an inner surface of the tire.

38. The device according to claim 37 wherein said inner surface is the inner tread lining of the tire.

39. The device according to claim 35 in which the energy converter is adapted to be embedded in a wall of the tire.

40. The device according to claim 35 wherein said energy converter comprises a magnet and a coil that are moved relative to each other by said coupled deflections.

41. The device according to claim 35 wherein said energy converter comprises a piezo-electric material that is deformed by said coupled deflections.

42. In a tire adapted to be mounted on a vehicle wheel, a device for obtaining energy from the tire while said tire is rotating upon a load-bearing surface, the device comprising:

a substrate attached to the tire at a selected radial and circumferential location;

an energy converter mounted on the substrate, the converter being disposed to respond to the load induced deflections of at least one tire inner wall to convert said deflections to an output energy form.

43. The device according to claim 42 wherein said energy converter is mounted on an inner surface of the tire.

44. The device according to claim 42 further comprising a base plate securing said substrate to the tire.

45. The device according to claim 44 wherein said base plate further has opposed parallel inner and outer surfaces and a periphery, said outer surface engaging an inner surface of the tire.

46. The device according to claim 45 further comprising:

a patch overlying the inner surface of base plate, said base plate being sandwiched between said patch and said inner surface of the tire, said patch further having a portion extending beyond said periphery of the base plate, said portion of said patch being bonded to said inner surface of the tire.

47. The device according to claim 46 wherein said patch includes an aperture through which the substrate projects.

48. The device according to claim 44 wherein said base plate is flexible and mounted within the tire.

49. The device according to claim 44 wherein said substrate is detachably secured to said base plate.

50. The device according to claim 42 wherein said substrate is attached to the tire by at least one fastener.

51. The device according to claim 50 wherein said at least one fastener includes a post anchored in a surface of the tire.

52. The device according to claim 51 wherein said at least one fastener is detachably secured to the post.

53. The device according to claim 42 wherein said output energy form is electrical.

54. The device according to claim 53 wherein said output electrical energy is pulsed.

55. The device according to claim 54 wherein said energy converter comprises a magnet and a coil that are moved relative to each other by the said coupled deflections.

57. The device according to claim 54 wherein said energy converter comprises a piezo-electric material that is deformed by the said coupled deflections.

58. The device according to claim 54 further comprising capture electronics for capturing said pulsed electrical energy.

59. The device according to claim 58 wherein said capture electronics further determines at least one feature of the pulsed electrical energy and adaptively changes its configuration so as to maximize the energy captured.

60. The device according to claim 59 further comprising at least one capacitor for capturing the said pulsed electrical energy and wherein the said at least one feature is the electrical energy pulse width and said configuration is adapted by selecting the capacitor value based on said pulse width.

61. The device according to claim 59 further comprising at least one capacitor for capturing the said pulsed electrical energy and wherein the said at least one feature is the voltage captured on the at least one capacitor from the pulsed electrical energy and said configuration is adapted by selecting the at least capacitor value based on said voltage.

62. The device according to claim 42 which further couples to the inner wall motion using at least one push rod attached to the at least one inner wall.

63. The device according to claim 42 which further couples to the inner wall motion using at least one cable attached to the at least one inner wall.

64. The device according to claim 42 which further responds to the centrifugal force of the rotating tire.

65. In a vehicle tire adapted to be mounted on a vehicle wheel, a device for monitoring at least one tire parameter and obtaining energy from the tire while the tire rotates upon a load-bearing surface, the device comprising:

at least one sensor to monitor the at least one tire parameter and producing a signal representative of the parameter;

a vehicle transmitter, coupled to said signal, for transmitting a representation of the signal to a remote vehicle receiver;

an energy converter disposed to respond to the load induced deflections of at least one tire inner wall and being adapted to convert said deflections into an energy output form; and

an energy transmitter coupled to said output energy to transmit said energy for use by said device.

66. A method for obtaining energy from the load-induced deflections of at least one inner wall of a vehicle tire while rotating upon a load-bearing surface comprising the steps of:

providing an energy converting device;

coupling said converting device to the at least one inner wall;

generating energy from the deflections of the at least one inner wall; and

outputting the captured energy.

67. A method for obtaining electrical energy from a vehicle tire while said tire is rotating upon a load-bearing surface comprising the steps of:

coupling an energy converting device to the load-induced deflections of at least one tire inner wall;

providing pulsed electrical energy output in response to said deflections;

determining at least one feature of the electrical energy pulses;

capturing the electrical energy pulses on a capturing mechanism;

adapting the capturing mechanism to maximize the electrical energy capture based on at least one feature of the pulses; and

outputting the captured electrical energy.

68. The method according to claim 67 wherein said at least one feature is the pulse width.

69. The method according to claim 67 wherein the source resistance of the energy converting device is known and said at least one feature is the ratio of the pulse width to the resistance.

70. The method according to claim 67 wherein the at least one feature is the energy captured.

71. A method for adapting a pulsed energy capture device, having at least one capacitor, to maximize the captured energy comprising the steps of:

determining the pulse width of the energy pulses;

selecting the at least one capacitor based on said pulse width;

using the selected at least one capacitor to capture the energy pulses; and

outputting the captured energy.

72. The method according to claim 71 wherein the pulsed energy source is electrical.

73. A method for adapting a pulsed energy capture device, having at least one capacitor, to maximize the captured energy comprising the steps of:

determining the pulse width of the energy pulses;

determining the source resistance of the pulsed energy source;

selecting the at least one capacitor based on the ratio of the pulse width to said resistance;

using the selected at least one capacitor to capture the energy pulses; and

outputting the captured energy.

74. The method according to claim 73 wherein the pulsed energy source is electrical.

75. A method for adapting a pulsed energy capture device, having at least one capacitor, to maximize the captured energy comprising the steps of:

capturing the energy pulses on the at least one capacitor;

outputting the captured energy;

determining the energy captured on the at least one capacitor; and

selecting the at least one capacitor based on the energy.

76. The method according to claim 75 wherein the pulsed energy source is electrical.

77. A method for determining the time duration of the load bearing surface contact region from a vehicle tire while rotating upon the load-bearing surface, comprising the steps of:

coupling an energy converter to the load-induced deflections of at least one tire inner wall;

providing pulsed energy output in response to said deflections; and

determining the duration of the contact based on the time between rising and falling edges of the pulses.

78. A method for determining the length of the load bearing surface contact region of a vehicle tire of known radius while rotating upon the load-bearing surface, comprising the steps of:

coupling an energy converter to the load-induced deflections of at least one tire inner wall surface;

providing pulsed energy output in response to said deflections;

determining the duration of the contact based on the time between the rising and falling edges of the pulses;

determining the period between contact regions;

calculating the length from the duration and period and the known tire radius.

79. The method of claim 78 where the period is determined by measuring the time between contact regions based on the rising or falling edges of the pulses.

80. A run flat tire having an inner core adapted with a cutout that accommodates a device mounted on an inner surface and protects said device as the tire is run flat.